

Bugg, Joy J.

From: David Sweanor [dsweanor@nsra-adnf.ca]
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To: Solana, Rick
Cc: Bugg, Joy
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Rick,

In the unlikely event you missed this I thought I'd pass it along.

Dave

Can Science Make Cigarettes Safer? - The Scientist

Various methods, mixed results | By Mignon Fogarty

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Courtesy of Vector Tobacco

READY, SET, STOP: Quest's 'step down' low- and no-nicotine cigarettes.

The major toxins in cigarettes, perhaps surprisingly, don't come from the chemicals that manufacturers add. "The carcinogens mostly come from the burning of tobacco," says Kenneth Warner, director, University of Michigan Tobacco Research Network. Just burning tobacco also produces carbon monoxide, a big contributor to heart disease.

So, tobacco companies are turning to science to make cigarettes safer. Through chemistry, mechanics, and genetic engineering, companies are producing cigarettes that they claim reduce secondhand smoke, and have fewer carcinogens and less nicotine.

One such product, Eclipse, heats tobacco rather than burning it. Inside a cigarette-like tube, heated glycerin and tobacco produce vaporized nicotine. The process produces less tar but more carbon monoxide, says Warner. With another product, Accord, users insert special cigarettes into a small electronic device. The unit's microprocessor ignites the cigarette when the smoker puffs, and it also sucks up secondhand smoke. Warner wonders about its future success. "You have to be pretty desperate to go around smoking a pager," he speculates.

Two other brands, Advance and Omni, claim to have removed major carcinogens. Omni, for example, uses a chemical process. "The tobacco is sprayed with palladium, which is a catalyst," says Tony Albino, Vector Tobacco's public health director. "It's not dissimilar in function from how a catalytic converter works. ... Palladium prevents the formation of a lot of carcinogens in the burning."

Vector is also using genetically engineered tobacco to produce reduced- nicotine and very-low-nicotine cigarettes. When Mark Conkling, now Vector's vice president of genetic research, was a professor at North Carolina State University, he serendipitously cloned a key enzyme in tobacco's nicotine synthesis pathway--quinolinate phosphoribosyl transferase (QBT). "Once we had the gene ... we introduced it back to make a transgenic tobacco plant," says Conkling. Using *Agrobacterium tumefaciens*, researchers stably integrated the

gene into the tobacco genome. A curiosity of this approach is that about 10% of the time the inserted gene inhibits the endogenous gene. Thus, they could isolate QBT knockout plants. Vector is now using one of these clones to produce low-nicotine Quest cigarettes.

The public health sector is skeptical about the safety of these products, partly because of the hope, and subsequent letdown, of low-tar cigarettes. "People just smoke them much more efficiently, inhale deeper, and don't put it down as much," says Gregory Dalack, University of Michigan, Department of Psychiatry. "That is part of the power of the addiction: They do it unconsciously." Says Warner: "We got very badly fooled by low-tar cigarettes. Most people thought these would be safer. ... Today, doctors are finding new forms of lung cancer, farther down in the lungs, attributed to people sucking down harder (on low-tar cigarettes)."

Filtered cigarettes, introduced in the 1950s, were another ruse, he says. Warner also notes that the new products could have added risks; he cites a 1998 study showing that the filters in Eclipse cigarettes release inhalable fiberglass particles, probably due to mechanical disruption during manufacturing.³ R.J. Reynolds, Eclipse's manufacturer, published its own analysis in 2000 showing that fiberglass particles did not exceed background levels.⁴

Although hardly enthusiastic, research-ers seem more optimistic about Quest, which in some ways is the exact opposite of nicotine-replacement products. "These new, very-low-nicotine cigarettes will ... give you the opportunity to deal with the nicotine withdrawal while maintaining the behavior. That may work for some people," says Warner. However, the cigarettes will have to go through Food and Drug Administration efficacy trials, he says, before people will have confidence that they actually work for smoking cessation. Vector says trials are planned.

Others think these cigarettes won't sell. "Smokers will go back to the nicotine to get that hit as long as it's available to them," says Robert Naso, senior vice president at Nabi Biopharmaceuticals, which is testing a nicotine vaccine. Vector's Albino rails against such criticism. "It's reverse, insane logic. The public health community has been calling for reduction of nicotine levels and a product like this for years, and Vector did it. They should embrace Quest and work with us if they really want to have an impact. ... The cigarette companies have acknowledged that smoking is harmful, addictive. ... The war is over. Just say[ing] no to drugs didn't work, and just say[ing] no to tobacco isn't going to work."

Says Timothy Baker, associate director, Center for Tobacco Research and Intervention, University of Wisconsin: "The best way to avoid smoking-related increases in morbidity and mortality is to stop smoking. That is the only thing we know with great certainty."

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References

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